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Queen Sirikit Botanical Garden

Thailand is rich in plant resources, having an estimated 15,000 species of vascular plants. Many of these are of economic importance, and a considerable number possess pharmaceutical value. There is, however, a serious lack of research on the uses of all these plant resources. We urgently need to integrate the management of plant resources with conservation in order to achieve sustainable development. In fact, a major focus of the Seventh Socioeconomic Development Plan (1992–1996) is natural resource development for sustainable utilization.

The Earth Summit in Rio de Janeiro during 3–14 June, 1992, emphasized the importance of natural plant resources, which have been deteriorating rapidly. This convention has triggered efforts to conserve our natural plant resources around the world.

The former Thai Government under Prime Minister Anand Panyarachun realized the importance and value of plant resources to the kingdom, and established The Botanical Garden Organization as a nonprofit government agency under the Prime Minister's Office. It was announced in the Government Gazette on 7 April 1993.

Queen Sirikit Botanical Garden is presently being developed in Mae Rim District (Amphur), Chiang Mai Province. It includes an area of 3,500 rai (560 hectares), consisting of mountainous terrain spanning 300 to 970 meters above sea level. It is at the border of Doi Suthep–Pui National Park.

The operation of the Botanical Garden Organization is similar to that of other well known botanical gardens world-wide. It is a place to conserve a wide variety of plants, including lower plants, flowering plants, ornamental plants and plants of economic importance. It will house an herbarium specializing on collections from North Thailand and neighboring countries, and will function as a center for plant research for the benefit of the people.

The overall objectives of the botanical garden are as follows:

—to become a botanical garden of international standard to serve as a center for research and social service in botany;
—to house a plant collection center (herbarium) for the region;
—to be a center for plant conservation and propagation;
—to be an institute for botanical research;
—to develop a plant data base;
—to serve as a center for nature study, recreation and public education in botany;
—to be a training center for young botanists so that they may learn the value of our plant resources.

The Botanical Garden Project was established to commemorate the Queen's Fifth Cycle Birthday. Prof.Dr.Sanga Sabhasri serves as chairman of the Executive Board and Dr.Weerachai Nanakorn has been appointed the first Director.

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Measuring and Monitoring Biodiversity in Tropical and Temperate Forests

The Empress Hotel, Chiang Mai, Thailand
August 28 – September 2, 1994

Quiz time! Faced with the loss of perhaps 30–50% of Earth's plant and animal species over the next 50 years, would you: a) measure genetic variation within a single species of commercial timber tree; b) count beetle species in the canopy of a tropical forest or c) combine the latest computer technology and satellite imagery to map disappearing wildlife habitats more accurately than has hitherto been possible? If you selected any of these, you would not have felt out of place at the international symposium on Measuring and Monitoring Biodiversity in Tropical and Temperate Forests, organized by the International Union of Forest Research Organizations and the Royal Forest Department.

Biodiversity—the variety of life, from DNA to ecosystems—became a buzzword in the 80s, as concern grew over the rate at which plant and animal species were being wiped out. That concern received global recognition at the Rio Earth Summit, with the drafting of a global convention on biodiversity, but the convention still has to be implemented and debate continues as to exactly how biodiversity can be defined, quantified and above all conserved. Consequently, the subject has become well-established on the international conference circuit.

The Chiang Mai symposium consisted of 54 spoken papers, about 30 posters, discussion sessions plus demonstrations of several computer packages.

Standard mathematical indices of diversity featured prominently in many papers, but several speakers questioned their value. As R.L. Kitching put it, "everyone agrees that data on the abundance and distribution of species are seriously lacking, so when such data *are* collected, why boil them down to a single index?". E.C. Pielou also criticized use of indices of what she termed old-style diversity, since they fail to take into consideration differences in the conservation value of different species. "Numerical measures of diversity are useless without considering species lists", she said.

But how can species lists be compiled, if species cannot be accurately named, due to lack of taxonomists? K.D. Hyde said that, in Australia, there are only 5 full time taxonomic mycologists working on an estimated 250,000 species of fungi. On the other hand, 25 taxonomists work on *Eucalyptus,* a single genus of timber tree, which contains only 600 species. The vertebrates and vascular plants are fairly well covered, but they represent only a very small fraction of the world's biodiversity. According to R. Kitching, "biodiversity *is* arthropods", in particular, beetles, which comprise a quarter of the world's known species. N. Stork neatly summed up the problem: "undescribed species have a greater probability of going extinct than being described".

The most impressive attempt to tackle this problem, is InBio's biodiversity survey and research program in Costa Rica, which trains local villagers, who may not even have finished high schools, as "parataxonomists". They work out of 26 simple field stations, in or near national parks, covering all habitats in Costa Rica. After 6 months' intensive training, parataxonomists collect specimens, sort them to order or family and preserve

them in the field stations. They also spend 20% of their time educating school children about biodiversity conservation. Some have gone on to become internationally respected specialists in particular taxa. Many participants were inspired by J. Jiminez's presentation on InBio and thought that this project is a model that many developing countries could follow.

Counting the numbers of species in different habitats is such a daunting task, it isn't surprising that scientists look for short cuts, such as predicting total biodiversity from the species richness of easily identified taxonomic groups; so-called indicator species. But which groups.....lichens, epiphytes, trees, birds, butterflies? All were mentioned in passing, but participants could not agree on which worked best. The majority view on indicator species seemed to be that we are still looking for them.

Another approach is to dispense with counting species altogether. Two papers described rapid, simple and practical forest survey methods to assess the degree to which forest ecosystems had been disturbed, the idea being that disturbance causes loss of species. H. Koop likened himself to an ecosystem doctor. "You don't have to dissect a patient to diagnose a disease, just learn to recognize the symptoms". His method was to look for early successional stages which indicate disturbance, including structural features (e.g. number of canopy layers) and plants which indicate light (e.g. grasses) and moisture (e.g. mosses growing on leaves). A. Gillison proposed a similar approach, using plants' morphological characteristics, especially leaf shape, the vascular system and above-ground roots. To demonstrate just how rapid his method was, he used it during the symposium field trip to Doi Inthanon and presented the results the next day. Some taxonomists took a dim view of such rough and ready methods, but they have a vested interest in promoting species as the units of biodiversity.

Several speakers thought that simply measuring biodiversity was not enough. We need to understand the processes that create and destroy it. There is no shortage of theories as to what factors cause some communities to be more diverse than others, but few of these theories have been tested. A. Young thought that data collection should be organized in such a way as to test these hypotheses.

But how does all this theorizing actually help conserve biodiversity? Too few papers provided practical advice to help forest managers and politicians make sensible decisions about how to conserve the world's diminishing species. One exception was L.M. Tsai's lecture on how to log a forest without destroying the trees' genetic diversity. Conventional logging removes the fittest genotypes. Tsai described how to design a logging system which maintains the population density of trees high enough to prevent genetic erosion.

Another practical concept described at the meeting was "complementarity", which helps planners decide where to establish protected areas and which areas should receive priority funding. Complementarity means that protected areas systems are formed by adding sites which contain the most species not already represented within the system.

This concept is one of the central features of WORLDMAP, a computer program which helps planners decide on where to put protected areas. I. Kitching demonstrated the program's latest features, such as the ability of the user to specity the minimum number of protected areas needed to adequately conserve each species. The demonstration used surveys of British birds, probably the largest data set of its kind in the world. However, in tropical countries, most species are undescribed and their distributions and taxonomic

relatedness unknown. This rather begs the question: why develop sophisticated, data–hungry computer models, if the data to feed them are lacking?

However, two excellent presentations showed just how such data are being collected in the tropics to feed complementarity models. M.J.B. Green described an extensive transect survey, recording plants and animals in all remaining forests in Sri Lanka. Using a computerized geographical information system, species complementarity was combined with the importance of sites as water catchment areas to determine the optimum protected areas system. P. Howard used a similar approach in Uganda where the 713 existing forest reserves were intensively surveyed for all species in five indicator groups (woody plants, mammals, butterflies, moths and birds). Sites were then scored according to the rarity of the species present and the degree to which each site contributed towards the full compliment of species found in Uganda. Thus an optimum protected areas system was arrived at.

Presentations on the final morning concentrated on international institutions and funding opportunities for biodiversity research. The emphasis was on large projects, linking institutes in developed and developing countries, but are such projects the best way to measure biodiversity?

K. Beese's description of how to apply for funding from the European Union left most participants' heads spinning. Projects must involve at least two institutes from developing countries and two from Europe. Once those links are formed, applications must pass through layer after layer of bureaucracy and committees. Many of the audience laughed out loud when Beese, explaining how he had simplified his diagram of the application procedure, displayed probably the most complex flowchart of the symposium. No wonder the EU has failed to disperse all its funds available for forestry research!

The need for institutes in developing countries to form links with those in developed countries, simply to gain access to funds, kills many projects. And are the huge sums spent flying foreign experts around the world really cost–effective, when so much biodiversity research involves simple tasks like measuring trees or trapping insects? Salaries and overheads in institutes in developed countries are extraordinarily high, often consuming a large part of grants for collaborative projects. In this way, money earmarked for foreign aid finds its way back to already well-funded museums and universities in the donor countries. Why cannot institutes in developing countries apply directly for funds from the European Union or Britain's Darwin Initiative?

Biodiversity projects are mostly simple and, if local people are employed or used as volunteers, cheap. Often they require only small grants which are readily accessible with a minimum of form-filling. The message I took away from the symposium was that international agencies offer no hope of such funding. Until they do, sponsorship from local companies and small foundations dedicated to conservation will continue to fill the gap.

It amazes me that, even with modern technological advances such as computer graphics and laser printers (not to mention thick colour pens), audiences at international symposia still have to suffer eye strain from squinting at overlays densely crammed with incomprehensible data tables. Too many speakers opened with that immortal refrain, "you probably won't be able to see this at the back..." and left me reaching for the eye drops and aspirin.

Notable exceptions were R.L. Kitching's presentation on arthropods in Australia—

"conservation of biodiversity is just as much an economic use of the forest as chopping it down and flogging the timber"—and K.D. Hyde's entertaining talk on fungi: "mycologists are fun guys" (geddit?). His infectious enthusiasm made me regret that I was not devoting my life to the study of mouldy bits of wood. However, if there was a prize for presentation, it would have to go to G. Lund for his colourful and humorous review of the latest technogadgets used to map vegetation from airplanes and satellites—"good planets are hard to find".

The posters were nearly all well-presented. A host of fascinating facts awaited those who found time to browse around the exhibition. Did you know that Doi Inthanon has the most species of springtails (wingless insects) (Deharveng *et al.* found 211 species in 367 soil samples, 169 of which were new to science); or that 82.4% of New Caledonia's vascular plants are found nowhere else, including the only parasitic gymnosperm known to science (*Parasiticus ustus* (Podocarpaceae), a relative of pine trees)?

By covering biodiversity at all levels of organization, from genes to landscapes, the meeting attracted a large and diverse audience, including geographers, molecular biologists, ecologists, statisticians, etc. Exchange of ideas between such diverse groups must surely be beneficial, but the diverse nature of the audience resulted in the symposium lacking a clear direction.

It became clear in the final discussion session that the symposium had not helped participants identify key issues and focus on them. One expectation from the meeting was that standard methods to measure biodiversity might be decided upon, so that data from studies all over the world become comparable. However, even this simple goal did not receive universal support. P. Kanowski, for example, felt that standardized methods would be too restricting and that methods must be adaptable to variable local conditions. Even a representative of IUFRO admitted that the meeting had not generated any information that would persuade development agencies to become more involved in biodiversity. A list of recommendations was drafted, but discussion of it petered out in disarray, as participants questioned the necessity of such a list.

However, the main value of such a symposium lies not in a list of recommendations, but in the personal contacts made between participants, which hatch new projects. Personally, I came away with lots of new ideas about how to improve my own research on biodiversity. I therefore have no doubt that this symposium will continue to generate benefits far into the future and that because of it, some of the world's millions of unknown species now have a slightly better chance of being described.

Anyone interested in receiving a copy of the symposium proceedings should contact Dr. Tim Boyle, CIFOR, P.O. Box 6596, JKPWB Jakarta 10065, Indonesia, FAX: +62 (251) 32-6433, E-MAIL: cifor @cgnet.com

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Can Community Forestry Save Biodiversity?

All over the world, governments are handing over control of state forests to local communities, in the hope that local communities will make a better job of managing them than state agencies. But can villagers satisfy their basic needs from community forests without depleting biodiversity? This was the main issue addressed at a seminar entitled "Community Development and Conservation of Biodiversity through Community Forestry" organized by the Regional Community Forestry Training Centre (RECOFTC) in Bangkok on October 26–28th 1994. The meeting was attended by 140 foresters, social scientists and aid agency officials. However, a lack of biological scientists, especially taxonomists, in the audience, severely limited its capability to deal with biodiversity issues. Twenty countries were represented and the organizers should be commended for supporting attendance of delegates from countries rarely seen at international seminars, such as Bhutan, Cambodia, Laos and Myanmar.

The idea of community forestry starts with the premise that government agencies have failed to halt deforestation and depletion of biodiversity, due to their bureaucratic nature, their susceptibility to corruption and the fact that national forest protection policies often disenfranchise people living in or near forests. Local people, therefore, have no interest in protecting forest resources which do not belong to them. Strict enforcement of protective measures by government forestry departments is usually infeasible due to inadequate financing and manpower and human rights considerations. Thus, for governments, community forestry is seen as a cost-effective alternative. The reasoning is that if villagers are given control over local forest resources, benefit from them and can pass on those benefits to their children, they will protect the forests to generate income in the future.

Community forests are established by contracts between governments and communities, usually after lengthy negotiations in which the villagers themselves suggest how the contract should be worded. This so-called participatory approach is seen as the key to the success of community forest management. However, in most cases, contracts stipulate that villagers must maintain the area under tree cover. Villagers are often encouraged to decide themselves which forest products can be harvested and in what quantities, but they must provide for the regeneration of the forest and governments usually retain the right to repossess the forest, if villagers convert the land to non-forest uses or attempt to sell or lease it to outsiders.

The seminar began with papers on broad topics such as why biodiversity conservation is needed and the links between conservation and development. Several speakers said that the idea that biodiversity can be conserved in inviolate reserves is outdated. According to D. Gilmore, we must accept the fact that more than 80% of protected areas have people living in them and that community forestry may be the only way of retaining at least some of the biodiversity in such areas.

Subsequent sessions covered case studies of community forestry projects and country reports. The papers covered a very broad geographic range from the montane forests in N.W. Pakistan to the wetlands of Kakadu National Park in Australia. Although vague aphorisms about integrating conservation with development appeared in almost all papers,

very few speakers described actual examples of both in the same paper. Most dwelt on community development. Very little actual data on biodiversity in community forests was presented.

A notable exception was W. Jackson's & A. Ingle's paper on the Nepal-Australia Community Forestry Project. They estimated that income to villagers from the sale of products from community forests could be as much as 9.5 times the development budget provided by the Nepalese Government. They found 98 plant species in forests managed by local Forest User Groups (FUG's) and only 54 in nearby degraded state forest. However, no data were presented on plant diversity before the forests came under community control.

K. Malhotra also presented data on plant species in community forests in southwest Bengal. In regenerating Sal *(Shorea robusta)* forest managed by village committees, he recorded 122 plant species of which 70 were gathered for domestic or commercial purposes, contributing up to 17% towards total family income. However, no data on biodiversity in non-community forest were provided for comparison.

Simply handing over forests to local communities does not always have desirable results. In P. Branney's and O. Dev's paper on the Nepal–U.K. project, they mentioned that villagers sometimes become so protective of their community forests, that damage to less well-protected state forests actually increases. Almost complete removal of deadwood from community forests for fuel deprives a diverse range of invertebrates of their habitat. Encouragement of economic species and elimination of non-economic species, which might compete with them, result in a more uniform forest with low diversity. Introduced exotic crops may smother local endemic species. What, then, is the future for the multitude of non-economic species within community forests? Is the high diversity of common, domestic plants found in community forests really an adequate substitute for the biodiversity of the original forest? These questions were mostly ignored at the seminar.

I felt uneasy that in none of the community forest projects described at the meeting had biodiversity been measured both before and after project implementation and compared with an undisturbed reference site. Until such data are published, the notion that community forestry can save biodiversity is an assumption, not a fact.

The bottom-up approach, where projects are initiated by villagers, often supported and encouraged by NGO's, seems to be the most popular. For example J. Ahmed and H. Khan explained that the Agha Khan project encourages the formation of village organizations (VO's) to take control of their resources. In Pakistan, VO's persuaded the government to give them control over a state pine forest which was being over cut by unscrupulous logging contractors. Now the VO's have worked out their own rules to harvest timber to meet local requirements without destroying the forest.

The idea that co-operation of local people is essential for the successful management of forests is hardly new. Yet speaker after speaker felt the need to promote the "participatory approach" with what amounted to evangelical zeal. Somehow I expected something more specific from the seminar than the reiteration of vague generalities which have been widely accepted for years.

However, top-down projects, initiated by governments can also be successful. In W. Bengal the government, driven by the need to reduce the costs of forest protection, initiates negotiations with villagers to form Forest Protection Committees (FPC's). K. Malhotra

claimed that 74% of FPC's were functioning well. Also in China, the government retains control. W. Wei described China's "Voluntary Tree-Planting Campaign" which stipulates that all Chinese citizens have an obligation to plant 3–5 trees per year.

The second half of the meeting was devoted to group discussions to draw up recommendations. The one I attended on planning and implementing community forest projects was, frankly, disappointing. Discussion was too vague and banal to be useful. Simple diagrams of the planning process (problem > knowledge > thinking > design > action) could be applied as easily to making a cup of tea as running a community forest. I think we all know that defining a problem and thinking about it are more likely to lead to a solution than not doing so. Not surprisingly, this failure to addresss specific issues meant that the nitty-gritty question of how can community forests be implemented to conserve maximum biodiversity was, once again, avoided.

Recommendations such as "develop techniques to determine important elements of biodiversity" were too general to be useful. As the international symposium on measuring and monitoring biodiversity held in Chiang Mai in August clearly demonstrated, there are already a wide range of methods available to quantify biodiversity. The question is: why don't community forestry experts know about them, use them and publish the results?

The conference showed that outside wildlife sanctuaries, in areas earmarked for rual development, community forestry has potential to both improve the quality of life of the rural poor, whilst maintaining as much biodiversity as can reasonably be expected in such areas. However, within protected areas where conservation of biodiversity is the main priority, it was not shown that community forestry could conserve the full range of biodiversity which such areas are meant to protect.

In bringing people from many different countries together and sharing experiences and outlining general principles, the seminar was undoubtedly successful, but I was rather disappointed that I left with very little new information about specific management activities that could help to retain biodiversity in community forests. As K. Warner, RECOFTC technical adviser, put it in her summing up "the objectives of the seminar have not so much been fulfilled as touched upon".

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Asian-Pacific Society of Marine Biotechnology Established

Following the conference on marine biotechnology in Asian-Pacific region in Thailand in November 1993, a consultative meeting for the establishment of Asian-Pacific Society of Marine Biotechnology (APSMB) was organized on the 14th of July, 1994. The meeting was hosted by Marine Biotechnology Institute of Japan. The objective of this meeting was to discuss the justification on the establishment and activity planning. The meeting finally agreed to establish APSMB. The initial member countries included Indonesia, Japan, Malaysia, Philippines, Palau, Singapore and Thailand.

Regarding the APSMB activities during the first three years, two symposia are planned. The first one will be organized in September 1995 in Shimizu, Japan. The second one will be in Phuket, Thailand in 1997. The society encourages the members to contribute their research articles for publication in the Journal of Marine Biotechnology. A special reduced subscription rate will be offered to the members. It is anticipated that the outcome of APSMB will bear fruit in creating and accelerating research and development in marine biotechnology in the countries of this region. In addition, a network of experts offering mutual assistance in this field might be created.

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First Conference on Trans-boundary Biodiversity in the Eastern Himalayas held in Kunming, China

During November 22–26 1994, the first conference for trans-boundary biodiversity conservation in the Eastern Himalayas was held in Kunming, China. The meeting was sponsored by the John D. and Catherine T. MacArthur Foundation, and was co-chaired by the Kunming Institute of Zoology and the Wildlife Conservation Society of New York. The meeting, which consisted of more than 50 delegates from China, India, Lao P.D.R., Myanmar, Nepal, Thailand and Vietnam, was the first time that high level government officials from this region were brought together to discuss biodiversity conservation along international border areas.

The Eastern Himalayas is considered one of the world's ten tropical forest hotspots. This region, which contains no less than 14% of the world's plant species and some of the most diverse faunal communities on the planet, has high levels of endemism for many species. Consequently, a small number of countries account for a high percentage of the world's biodiversity.

The purpose of this meeting was to highlight the fact that the countries of the Eastern Himalayan region require immediate international attention. Over the last ten years, habitat loss has been the greatest threat to this region's biodiversity and has been the primary focus for many in-country conservation programs. More recently, however, this region has seen accelerated industrial development, growing economic prosperity, and has become linked to the global marketplace. Rapidly changing economic and socio-political issues have created new problems that immediately threaten many individual species of plants and animals, as well as the region's complex biodiversity as a whole. This surge in economic development is having its greatest affect on local community lifestyles and on existing forest communities along the trans-border regions between China, India, Nepal, Myanmar, Thailand, Laos and Vietnam.

Until recently, many of the countries in this region had been isolated by political and ideological differences. However, the wave of economic growth and prosperity in the region has resulted in the rapid creation of new cross-border marketplaces and the development of inter-country joint ventures, primarily aimed at exploiting existing natural resources. Yet, most of these countries vary greatly in their policies for managing natural resources and there has still been little or no communication between government officials or national NGO's regarding trans-boundary conservation, development, and sustainable resource use. It has become painfully clear that inter-government cooperation and coordination regarding the region's biodiversity is an urgent need for the international community.

Of all the countries in the region, few can boast of such rapid development as China. Unfortunately, while China can claim some of the highest levels of biodiversity in Asia, it has also been subject to some of the highest rates of decline of this diversity. This is particularly evident in Yunnan Province, once considered China's "frontier." Although Yunnan Province comprises only 4% of the country's land area, it is believed to contain at least 50%

of its fauna. Most of this biodiversity is concentrated in two areas, Gaoligongshan in the far west which connects with Myanmar, India and the Eastern Himalayas, and Xishuangbanna in the far south connecting Myanmar and Laos. All of these areas are being rapidly developed.

Another, perhaps more important fact is that Yunnan Province is the intermediary for three crucial watersystems that dominate the lives and culture of many of the countries in the region. These river systems include the Mekong River which flows through Laos, Thailand, Cambodia and Vietnam, the Red River which flows into Vietnam, and the Salaween River system flowing between Myanmar and Thailand. Habitat loss and environmental degradation along any or all of these river systems in southern China could have disasterous ramifications throughout large areas of the Indochinese peninsula.

The fact that southern China maintains a border with as many as six countries (India, Nepal, Bhutan, Myanmar, Laos and Vietnam) and contains watersheds which comprise the lifeline for many of the countries in Indochina, means that any policies or activities concerning resource exploitation can have large ramifications throughout the rest of the regon. This has already been seen with the traditional medicine cross-border trade which threatens important large mammal species such as tiger and rhinoceros. Therefore, by hosting this meeting, China signalled its willingness to take a leading role in the policies and management of its own resources, while helping to coordinate regional policies concerning natural resource use.

The Kunming Institute of Zoology of the Chinese Academy of Sciences has a 35-year history working on the fauna in south-west China, and is one of the premier institutions of zoology and conservation in the country. There has already been an on-going and very successful program of training, research, and education through the Institute, in conjunction with the John D. and Catherine T. MacArthur Foundation and the New York based Wildlife Conservation Society. Furthermore, the influence of the Kunming Institute of Zoology on the central and local government officals concerned with forest and environment forms an important working bridge between the international community and the Chinese government at all levels.

This primary purpose of this meeting was to create a forum in which government officials and some national NGO's could openly discuss issues such as trans-boundary exploitation of forest areas, illegal trade in endangered species across borders, and the future of important water resources and its effect on local communities. As a result of these discussions, an action plan was drawn up that opened lines of communication and information exchange for the future, and addressed some immediate issues of regional resource management along particular borders.

After three days of presentations and workshops at this conference, the delegates agreed that the following themes and problems were common to all of their border areas:

I. *Common trans-border biodiveristy themes of each country.*

1) Maintaining biodiversity is important for the well-being of any country.

2) All countries present here at this workshop, feel that they have a relatively rich biodiversity.

3) There has been much effort in each country to establish a good system of protected areas, and good laws for protecting biodiversity.

4) Training of staff is an important component of forest and wildlife protection and management.

5) The general public is more aware and more concerned about conservation of natural resources today than ever before.

6) Although trans-boundary protected areas are important for biodiversity conservation, the sensitivity of border areas must be taken into account.

7) Good communication and cooperation regarding trans-boundary biodiversity between governments of neighboring countries has been lacking.

8) Since each country has sovereign rights to use its biodiversity as it sees fit, it is only through serious and continued mutual cooperation that trans-boundary protected areas can work.

9) The efforts of individual countries sharing major river systems should be coordinated to conserve the biodiversity of these river systems.

II. *Common problems acknowledged by most countries for border areas.*

1) Many protected areas, particularly along borders, are small and fragmented.

2) There is often widespread and uncontrolled exploitation of resources within and around protected areas.

3) Border trade in wildlife has not yet been brought under control.

4) There is a lack of proper monitoring and management throughout many of the protected areas or forested areas along borders.

5) There is a lack of research and thus inadequate baseline data regarding the flora and fauna in the forests along many border areas.

6) Many protected areas and forest reserve areas along the borders are being rapidly degraded.

7) There is not enough known about resource use by local communities in the border areas and indigenous knowledge is not always integrated into efforts for biodiversity conservation.

8) The protection of forests and wildlife is often affected by political and socio-economic needs that place low priority on biodiversity conservation.

9) Wildlife populations, particularly certain key species, are declining in many areas, despite the protected area systems.

10) Although countries with protected areas on both sides of a border have acknowledged the need for cooperation, there has been little more than talk in the past.

Early in the discussions of the working groups it was agreed that the setting up of international teams for surveys or other assessment work in border areas was too premature at this

early stage in trans-boundary cooperation. therefore the discussion focused on bi-lateral cooperation agreements between certain nations.

It was agreed that some specific actions to be taken immediately under the framework of bi-lateral arrangements would include the following:

i) Information gathering within each country to determine the status and extent of biodiversity, particularly along the border areas.

ii) Information sharing (publications, reports, maps, etc.) between bordering countries regarding existing forested areas, survey information, proposed and existing protected areas, and resource use. Such information exchange should not be restricted to the border areas alone.

iii) Bi-lateral survey teams between China and Vietnam to assess possible sites for trans-boundary reserves along the border.

iv) Future meetings and workshops to compare progress on resolving some of the key issues discussed above, discuss possible future joint endeavors, and work towards the creation of paired protected areas along borders.

By the close of the meeting, the following summary statement was prepared and agreed upon by all of the delegates present:

"The delegates of the participating countries of China, India, Lao P.D.R., Myanmar, Nepal, Thailand and Vietnam who have attended the workshop of Trans-boundary Biodiversity Conservation in the Eastern Himalayas held on November 23–26, 1994 at Kunming, China agree to the following statements:

I) We recognize the importance of maintaining the rich biodiversity of the region.

II) We recognize the urgent need to cooperate and work together for the conservation of trans-boundary biodiversity.

III) We recommend that interactions and information exchange on trans-boundary biodiversity issues continue in the future.

In order to address the recognized issues and help facilitate suggested actions of the working groups, we request that the Wildlife Conservation Society, in conjunction with other international and national NGO's of the region, help coordinate future interactions and information exchange between the countries of this region.

Finally, we would like to suggest that a second Workshop of Trans-boundary Biodiversity Conservation in the Eastern Himalayas be held in two years time to be hosted by The Myanmar Forestry Department in Yangon, Myanmar. At this time, we will review the progress that has been made to date on trans-boundary biodiversity conservation and we will discuss new actions for the future."

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